

GEEL 2000 Language Schools

SCIENCE

Primary (6), Unit (2), Part (2)



Second term



Concept (4.1, 4.2)



Name:

Class:



Concept (4.1) Lesson (1)

Adapting to survive



How do environmental factors and genetic factors affect the growth of living organisms ?

- Living organisms can't survive easily in desert environment

Due to the hard environmental factors such as extreme climate conditions.

- Living organisms can grow well when there are enough environmental resources such as water, food.... etc.



- living organisms adapt to the changes of the environmental conditions in their habitats and to the shortage in the environmental resources to survive.



• Small dorcas gazelle is similar to its parents.

(Give reason)

Because it gets some properties from its parents (genetic factors) that allow it to survive in desert environment such as:

- Its body color helps it to adapt its environment.
- It does not drink water for several months.



Adaptation:

It is the process that helps living organisms to survive in the environment in which they live.



Structural adaptation (Physical adaptation)

Definition

It is the adaptation that is related to the body structure of a living organism to help it survive.

Examples

- Thorns on the stem of some plants.
- The thick fur of some animals that live in cold climate



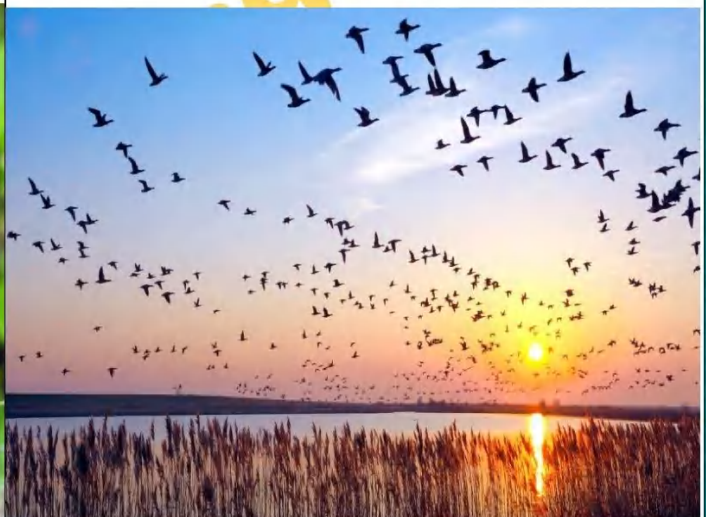
Behavioral adaptation

Definition

It is a change in the behaviors or acts of a living organism to help it survive.

Examples

- The growth of some plants toward light.
- Bird migration.



Bird migration:

- Migration is a **behavioral adaptation** as:
- Migration of a group of animals (like birds) move together from one place to another seasonally and they return to the place from where they are started (their cycle of migration is repeated).

Example of migratory birds: **Steppe eagle.**

Reasons of bird migration :

Birds migrate to search for the best conditions that help them reproduce (breed) and preserve their species, such as:

1. Different food sources.

2. Suitable habitats during different times of the year.

Environmental and genetic influences (effects) on migratory birds :

• **Migratory birds may face many challenges during their journey such as :**

- Extreme weather conditions.
- Shortage of food and water.
- Predators.
- Limited resting sites due to habitat loss.

★ **Migratory birds have structural characteristics (physical traits) that help them to survive during their journey.**

Migratory birds in Egypt :

Examples : Falcons - Eagles.

- **The Red Sea and Nile River** are from important **stopovers** for millions of migratory birds every year.



The main factors that attract the flocks of migratory birds to Egypt:

1. The moderate winter climate.
2. The area of Red Sea that contains different environments such as
- Coastal environment - Marine environment - Mountain environment.

Basic needs for living organisms :

Living organisms need some basic needs to survive such as:

• Food • Water • Habitat.

Influencing growth:

The environmental factors and genetic factors affect behaviors, structure and the growth of living organisms.

Examples of environmental factors:

1-Availability of water and light:

1. Affect the growth of plants as they make photosynthesis process.
2. Affect the growth of plants as trees, shrubs and animals in an ecosystem.
3. Affect the amount of plants on which some animals feed on.



2- Size of habitat.

It affects the number of different species that live in one place.



Examples of genetic factors (Hereditary traits)

1- The body size of animals.

It affects the growth of a kitten when its body size changes gradually until it becomes as its parents.



2- The length of plants.

It affects the growth of plants like herbs usually shorter than the long flowering plants in a forest.



3- The fur color of animals.

It affects the shape of a young rabbit when it has brown spots on its fur, like its parents.





Concept (4.1) Lesson (2)



Characteristics of the Environment and ways of Adaptation of Living Organisms

There are different kinds of environments such as:

Arctic, desert and tropical rain forest environments.

► Each environment has:

- Its specific climate.
- Different types of animals and plants with traits that help them to survive in their environment such as:

Emperor penguin



Location:

The Antarctic.

Adaptation:

It has thick blubber (fatty layer) and its skin is covered with dense feathers to keep its body warm.

African penguin



Location:

Along the coast of South Africa.

Adaptation:

Around each of its eyes, it has a Circle of skin that doesn't have any feathers completely to help its body cool fast in hot weather.

Adaptation of different animals and plants in different environments:

a- Animals :

Environment (Habitat)	Animal	Structural adaptation	Reason
Arctic environment.	Arctic fox 	It has thick white fur.	To warm its body
Tropical rain forest environment	Poison dart frog 	It has colorful poisonous skin.	To hide from its enemies and protect itself from predators.
Desert Environment	Lizard 	Its body is covered with sandy-colored scales.	To hide among the rocks in desert.

B Plants:

Plants in desert environment:

Location: Egypt's Western Desert.

Examples: Acacia trees, palms, opuntia, spiny shrubs and grasses.

Adaptations: Most of them are characterized by the following :



1- Size: Most of them are small and herbal.

2- Roots: Most of them have short extended roots near the Earth's surface to draw (absorb) any available water.

3- Leaves: Some of them have thick leaves to store water.

4- Stem:- ★ Some of them have thick stems to store water.

★ Some of them have thorns on their stems and branches to keep away herbivores (animals that eat plants).

Note: When the rain falls in deserts, some plants reach the flowering stage quickly and produce seeds that can live for a long time to adapt the shortage of rainfall.

Abiotic Factors and Adaptation

Ecosystem may be :

• Small ecosystem such as :

A small area of land between buildings that contains grass, insects and weeds.

• Large ecosystem such as:

The arctic where- Caribou feeds on grasses, wolves hunt caribou and other preys.



Ecosystem contains :

Biotic factors	Abiotic factors
They are living organisms in an ecosystem such as: Human -Animals - Plants.	They are non- living things That interact with each other in an ecosystem such as : Sunlight- Air- Water- Soil - Temperature - Precipitation.

- Plants and animals live in the same ecosystem depend on each other to live and reproduce.

► *The effect of abiotic factors on the growth of living organisms*

★ Light is an abiotic factor and

Environmental factor:

It affects the growth of plants.

- ★ Plants respond to the amount of light and dark they receive daily.



- ★ Some flowering plants may (produce)

bear fruits when the days are longer than the nights in some environments.

- ★ Light helps in the plant's growth.

- ★ If light is too intense, it damages the plant's parts and cause their drying or burning.

- ★ **The effect of abiotic factors on the adaptation of living organisms:**

- ★ Water and light availability or limitation are considered the most important factors for the adaptation and survive of living organisms in their ecosystem.

- ★ If water and light are not available, living organisms can't survive and will die.

Note

- ★ Living organisms have structural characteristics (physical traits) to adapt to abiotic factors in different environments.
- ★ These structural characteristics transfer from parents to offspring and help them to survive in extreme environmental conditions.

Limited resources in the desert :

- Deserts are the most extreme environments on the Earth.
- Deserts may be hot area or cold area.
- All types of deserts have little rainfall.

Hot deserts

- ★ They have little amount of ground water far below the ground surface.
- ★ Small pools of water are formed inside rocks during rains that falls for short periods of time on deserts.
- ★ Some plants which live in these environments have long roots to get the deep groundwater.
- ★ Other plants have short extended roots near the Earth's surface catch the smallest drop of dew.



Cold deserts-

- ★ Antarctica is a desert biome that its temperatures are cold all the year.
- ★ Its temperatures in winter go below freezing (below 0°C).
- ★ Its temperatures in the short summer reach a maximum of (21°C).

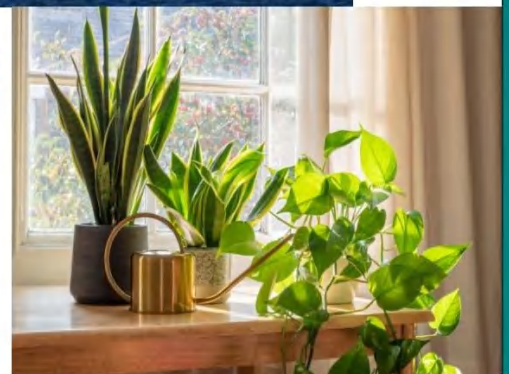


The plant's growth is affected by :

1. The intensity (quantity) of light affects the plant's growth.
2. The duration of light means the amount of time that a plant is exposed to light affects the plant's growth.

- ★ Some flowering plants bear fruits when the days are longer than the nights in some environments.

- ★ Some other flowering Plants grow and produce flowers when the days are shorter than the nights such as **Chrysanthemum plant**.



Concept (4.1) Lesson (3)

Inheritance of Traits in Living Organisms



★ All living organisms inherit traits which transfer from parents to their offspring.

► Examples of inherited traits in living organisms:

★ In humans such as eye color, nose shape .. etc.

★ In animals such as fur color, fur length etc.

★ In plants such as plant's length, shape of leaves ... etc.

★ The inherited traits affect the structure of living organisms and their life.

★ Genetic factors control what traits get passed down or inherited from parents to offspring

1- In animals :

<u>Birman cat</u>	<u>Sphynx cat</u>
It has long, silky hair with different colors. A Birman kitten inherits the long, silky hair from its parents. 	It doesn't have any hair or may have only very fine hair. A sphynx kitten inherits its hairless body from its parents.. 

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Give reason for:

Although Birman and sphynx are cats, there is no sphynx cat has long hair like Birman cat.

Because sphynx cat doesn't have the genetic factor for long hair which is found in Birman cat.

2 Plants in the desert:

Inherited traits which transfer from parent plants to their offspring,

help plants in deserts adapted to survive in extreme conditions of desert such as the very hot weather and very little rainfall.

So, each generation of plants becomes stronger and able to adapt.

The factors that affect the human growth health and behavior development:.

- 1. Lifestyle choices.**
- 2. Environmental factors.**
- 3. Genetic factors.**

1- Lifestyle choices :

- ★ They affect the health and they depend on habits.
- ★ Bad habits like smoking and eating a diet full of chips and soda will negatively affect and harm your health and your growth.



- ★ Good habits like eating a healthy food and doing exercises play an important role in your growth and develop your health and behaviors.



2- Environmental factors :

- ★ They are outside factors which we might not have the ability to control.
- ★ If your environment is healthy and clean, it will positively affect your health and your growth.



- ★ Your health and growth will be negatively affected, if there are some problems in your environment, such as:

- Health care is not available.
- Water may be far away or unsafe to drink.
- Difficulty to obtain food.
- Sanitation service is not available, that causes spreading of different diseases.

3- Genetic factors :

- They affect the body structure as your hair color or eye color are like your parents.
- Genetic factors control the transfer of inherit traits from parents to offspring.



Genes



Are tiny structures which found in the nucleus of the cells of living organisms.

★ Genes carry inherited traits from parents to offspring,

★ Genes are responsible for determining the body features

such as :

- The way of your earlobes hang.
- The length of your fingers.
- How tall you.



Concept (4.2) Lesson (1)



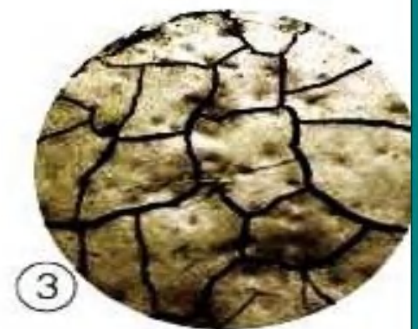
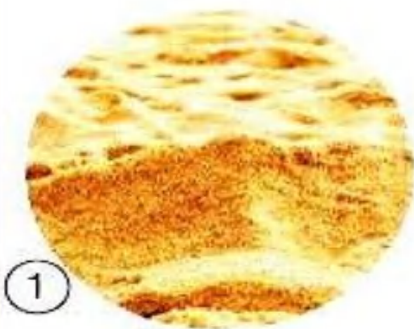
Soil and environmental change



Soil :

- ✓ It is the loose layer (delicate skin) which covers the Earth's
- ✓ crust. **OR**
- ✓ It is a basic factor for all natural ecosystems on Earth.

Types of soil:



1 Sandy Soil

2 Silty Soil

3 Clay Soil

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The differences and similarities between the different types of soil

Differences	Similarities
They have different colors and textures.	All types of soil are composed of natural components.
The size of soil particles may be large, medium or small.	All types of soil keep the life on Earth.

Effects of environment on the soil:

When the **air temperature increases** in an environment, **the soil will dry and may lose its nutrients.**

Give reason for:

The environment varies according to the type of soil.

→ because the soil has an important role to determine the type of plants that grow in it, and the species of animals which live in this environment.

The formation of soil :-

Soil is formed of some ingredients (components) such as :

1- Sand, gravel and minerals which are formed due to breaking down of rocks through the weathering process.

2- Organic materials such as dead plants.

3- Living organisms.

4- Water.



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The main processes in the formation of different landforms on Earth and soil .

Weathering and erosion.



Erosion

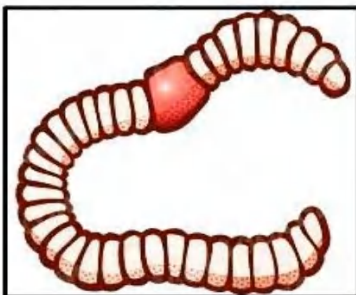
Weathering



Importance of soil:

1. Soil is important for the plants that people and animals feed on to survive.
2. Soil provides the plant with its basic needs for growth as air, water and nutrients.
3. Some living organisms make their shelters in soil such as: worms, insects, fungi and bacteria.

Decomposers



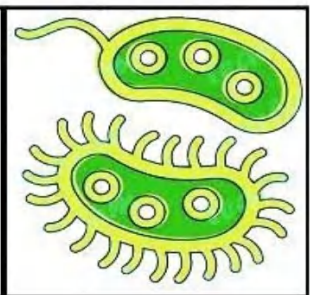
Worm



Mushroom



Insects

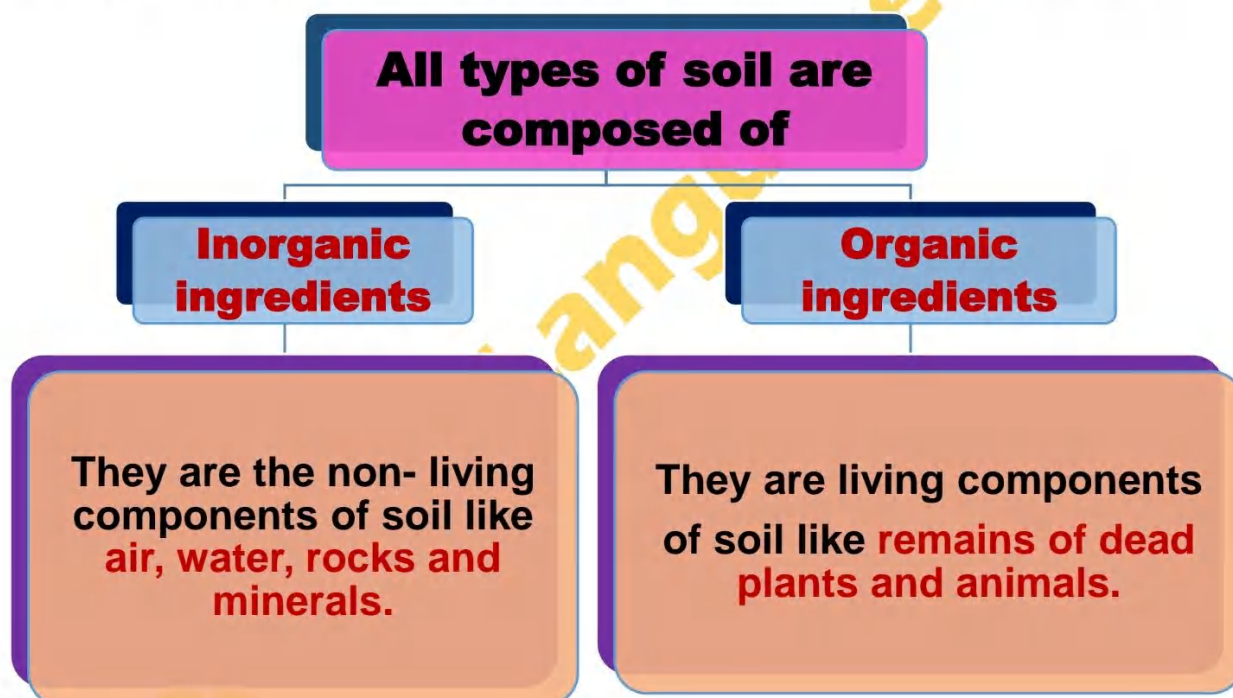


Bacteria

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❖ Composition of the soil:

- 1- Small pieces of **rocks, sand, gravel and minerals** which are formed due to breaking down of rocks through the weathering process and **other dark colored materials**.
- 2- Organic materials such as **dead plants (small pieces of leaves and branches (twigs) of trees**.
- 3- Living organisms and water.
- 4- Other components of soil that can't be seen with naked eyes.



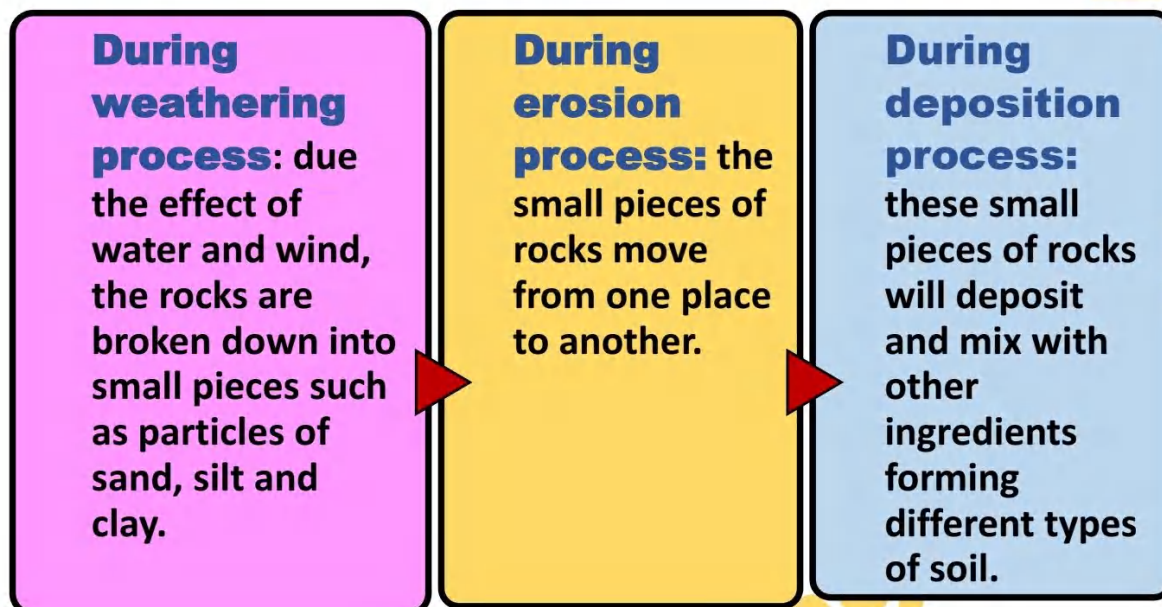
Note:-

Rocks: are composed of different types of minerals.

Minerals: they are the building units (blocks) of rocks.

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➤ How inorganic materials of soil formed..?



➤ How organic materials of soil formed :

- Decomposers recycle the remains of dead plants and animals into chemical nutrients such as carbon, nitrogen and oxygen which are released into soil, water and air that help in the flowing of energy in the environment again.
- Decomposers break down the organic material of dead organisms into components rich with nutrients which called "**humus**" which increases the soil fertility that helps plants to grow.

Give reason for

- 1- Decomposers such as: fungi, bacteria and earthworms play an important role in the formation of soil.
- 2- Decomposers have an important role in the formation of soil.

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➡ because, they recycle the remains of dead plants and animals into chemical nutrients such as carbon, nitrogen and oxygen which are released into soil.

Note:

-Minerals and organic materials represent about half of the most types of soil.

-The other half of soil consists of spaces between the particles

of the soil known as : pore spaces [each pore space is filled with water and air].

❖ Different soils, different ingredients:

There are many types of soil.

➡ Due to the different amounts of ingredients that form them.

The difference of the amounts of organic ingredients in the soil lead to:

- 1- Changing the appearance of the soil.
- 2- Changing the amount of nutrients that is available for plants.

The difference in the size of particles and amount of different inorganic ingredients leads to:

- Changing the appearance and texture of the soil.
- Changing the ability of soil to retain (keep) water.
- Changing the ability of soil to allow roots to grow.

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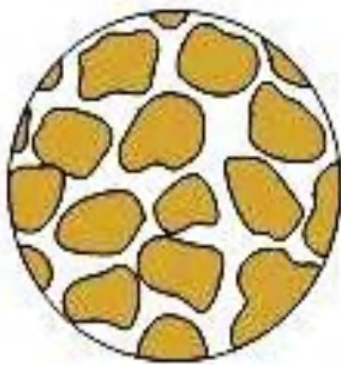


Examples:

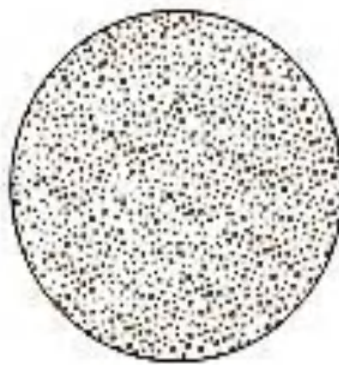
Sand → has large particles

Silt → has medium particles

Clay → has small particles



Sand



Silt



Clay



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Characteristics of the different soil particles

SAND



1. Large in size
2. Large space between particles
3. Gritty, rough or coarse
4. Non- Sticky
5. Good drainage ability
6. Poor water holding capacity

SILT



1. Medium in size
2. Medium in space
3. Smooth and slipping, floury
4. Non- Sticky
5. Medium drainage ability
6. Medium water holding capacity

CLAY

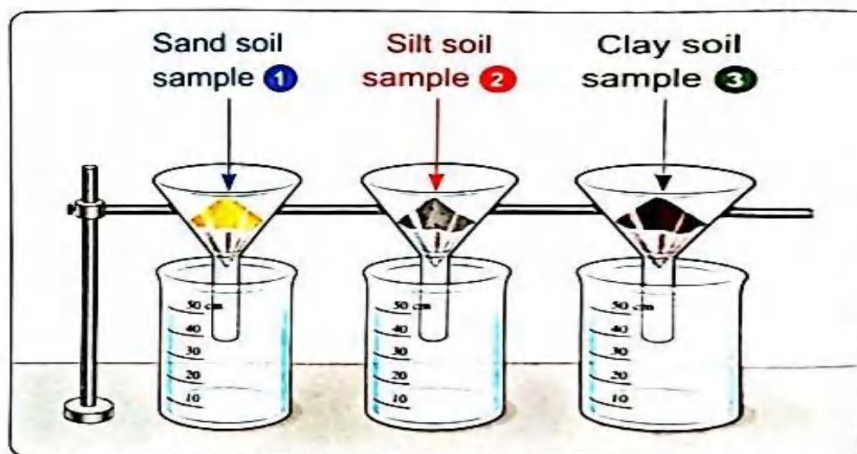


1. Very fine in size
2. Small space between particles
3. Sticky when wet
4. Hard when dry
5. It swell and shrink
6. It absorbs water
7. Poor drainage
8. Good Water Holding Capacity

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Comparison between the three types of soil:

Points of comparison	Sand soil	Silt soil	Clay soil
The size of particles	Large	Medium	Small
Color	Yellow	Gray	Dark
Flowing of water through it	Fast	Medium	Slow
Retaining water:	Small	Medium	Large

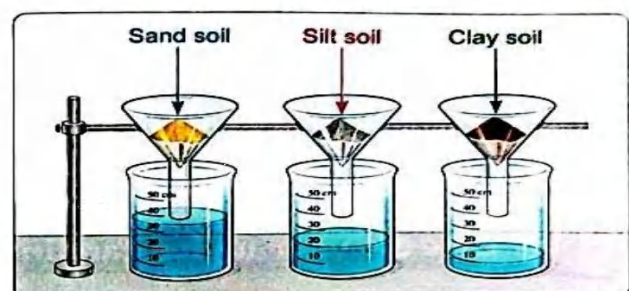
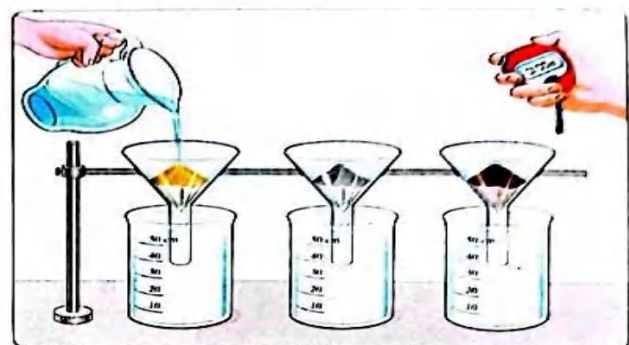


Funnels inside
measuring
cups

Pouring 50 ml of water in each funnel, and at the same moment, start to record the time by using stopwatch.

Conclusion :

- **Sand soil** (sample ①) : allows water to flow fast through it, this means that it has large amount of pore spaces (pores) between its particles, so sand soil can retain (hold) small amount of water.
- **Silt soil** (sample ②) : allows a medium amount of water to flow through it, this means that it has medium amount of pore spaces between its particles, so silt soil can retain (hold) medium amount of water.
- **Clay soil** (sample ③) : allows water to flow slowly through it, this means that it has small amount of pore spaces between its particles, so clay soil can retain (hold) more amount of water.



Give reason for:

The soil that retains medium amount of water becomes more fertile.

Because it keeps its organic materials and this helps in the plant growth.

Soil and climate :

★The soil is formed of many layers.

★Both soil and climate affect each other in the ecosystem as: the types of plants that grow in a certain soil have a large impact on the temperature and also, the climate of any ecosystem affects the characteristics of the soil in it.

Example :

1-The humid areas:

• During rainfall, the soil of humid areas retains large amount of water, that may wash down the nutrients of the soil, so some minerals may fall below the soil layers, this will form a hard layer that plant root can't penetrate.

Give reason for:

The roots of some plants can't grow and some living organisms can't live in humid area .

➔ because, these areas become water logged soils that contain very large amount of water and little amount of air



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2-The hot – dry areas:

Give reason for:

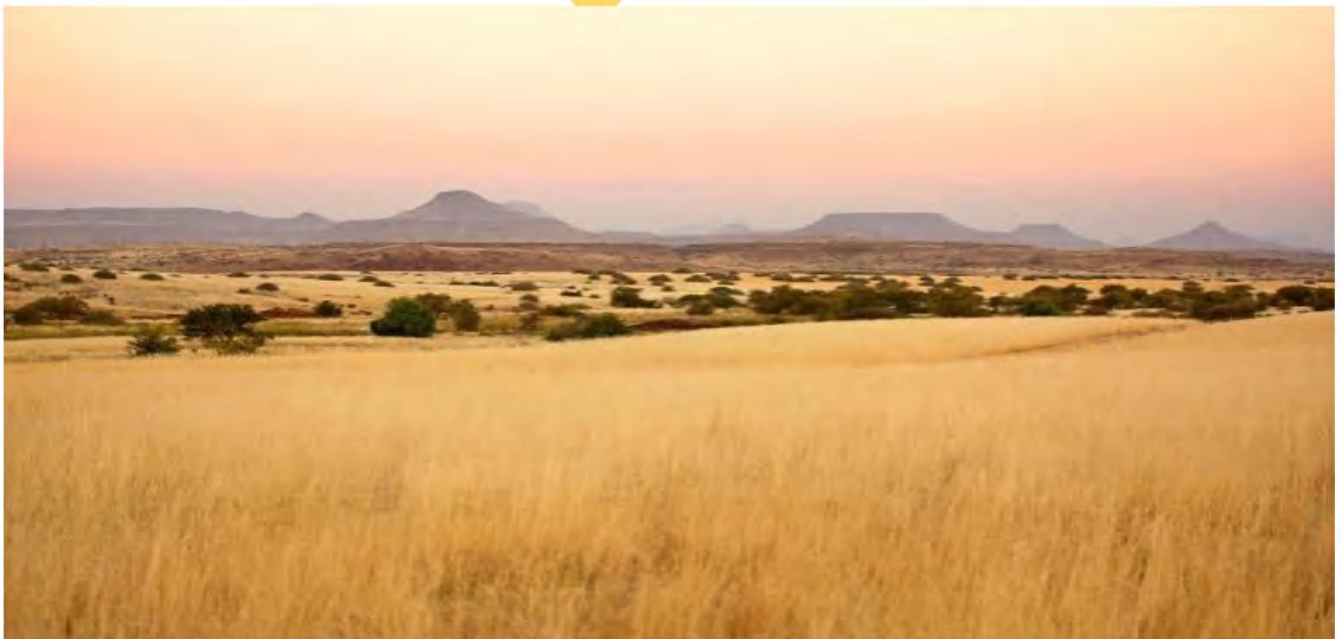
In hot and dry areas, the soil which rich with clay particles, the clay becomes dry.

Because of drought conditions that will form a layer doesn't allow much water to flow.



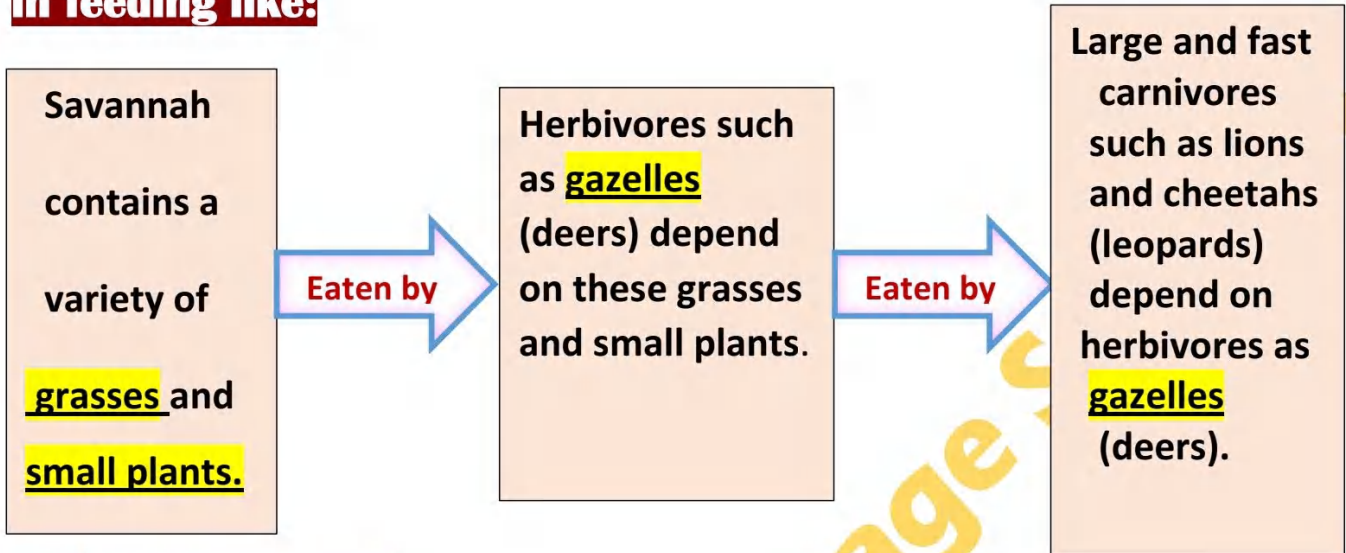
3- Dry soils:

- The sand soil is dry and loose that drains water quickly.
So, large trees can't grow in it.
- Savannas are grassland ecosystems that contain dry sand soil and they are common in central Africa.



Living organisms live in savannas depend on each other

in feeding like:



❖ Soil in a bog :

- Clay soils which rich with clay particles retain much water, so the soil may be wet most of time.
- Most of plants that grow in this wet soil are basic for bog ecosystem.
- The moist conditions in bogs, lead to very cool temperatures.
- The most common animals live in bog ecosystems are: frogs and mosquitoes



Concept (4.2) Lesson (3)

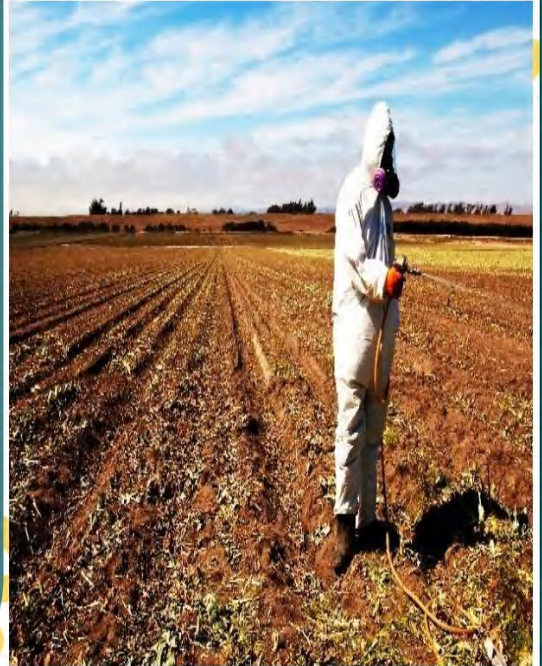


❖ Poor agricultural practices have many impacts on the soil such as:

1- Deplete the soil:

❖ Due to:

1. Converting fertile agricultural lands (arable lands) into cities, factories and pastures.
2. Overuse of pesticides.
3. Overuse of chemical fertilizers.
4. Air and water pollution.



2- Desertification:

It is a process by which the land becomes infertile due to deforestation, drought or overgrazing.



Ways of soil restoration:

1. Adding nutrients which have been depleted back into the soil by using
 - ✓ Crop remains (residues) like: straw and stems (stalks).
 - ✓ Natural fertilizers like animal's manure.
2. Crop diversification which means planting different types of crops and rotating them with crops that keep the soil fertility.



Factors affecting crop quality:

- The quality of some crops (like tomato) is affected by many factors such as:

1. Regular and moderate irrigation.
2. Adding suitable amount of organic fertilizers.

Unsuitable environmental factors may lead to:

1. Producing weak plants.
2. Reducing the amount of crops.
3. Spreading of plant diseases among crops

Erosion process of soil:

- There are many factors that lead to the erosion of soil such as:

1. The type of soil.
2. Removing plants.
3. Increasing the amount of water.
4. Increasing the inclination (slope) of the Earth's surface.

All the previous factors lead to increasing the speed of moving water over the Earth's surface.

The soil particles are washed down by moving water and causes soil erosion.

➤ Ways to reduce the soil erosion process:

1. Increasing the planted areas.
2. Digging canals or trenches to collect the excess water in the soil.
3. Adding sand and silt to the soil that help in decreasing the effects of moving water over the soil.

➤ Habitat destruction:

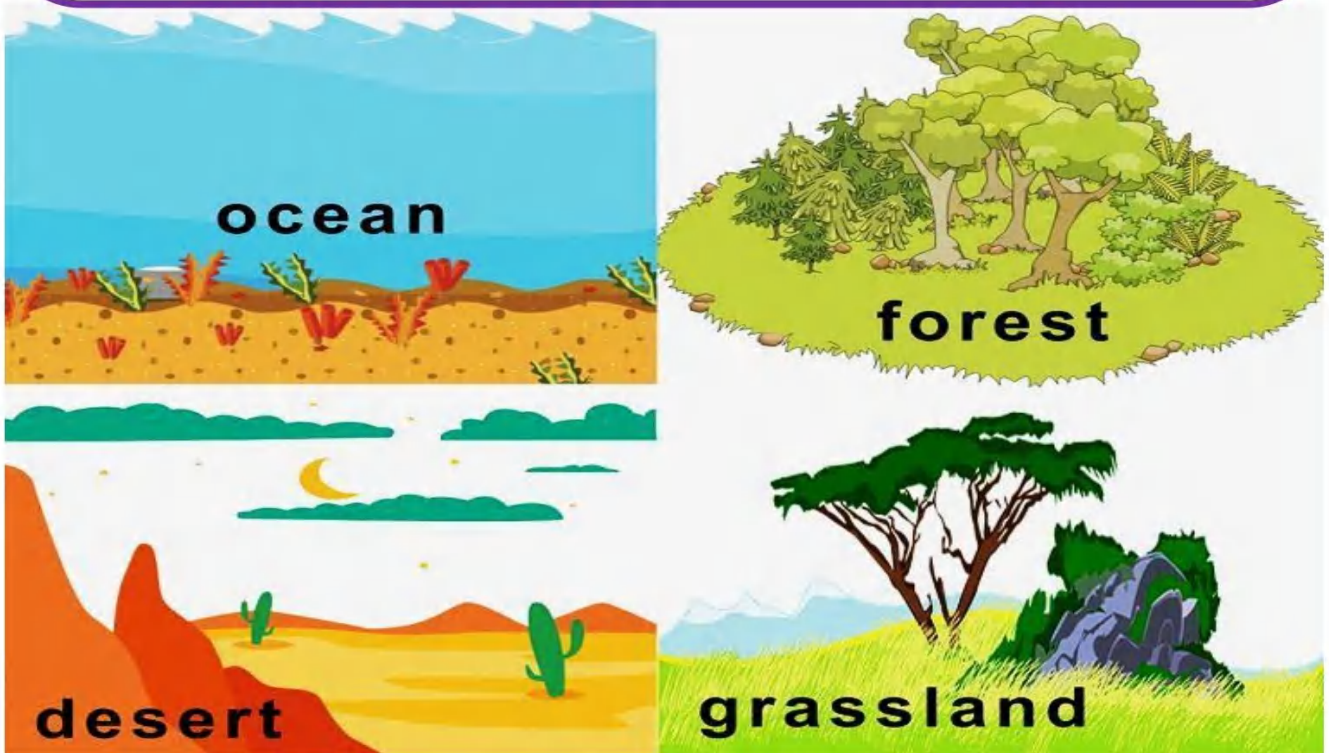
Habitat: It is a place where living organisms live.

Examples of some habitats:

Desert – Forest – Stream – Ocean – Grassland

All habitats provide four important things for living organisms, which are:

Food – Water – Shelter – Space to live



- **Habitat destruction**, when one of the previous four things is depleted or taken away.
- Any change, even a small one in a habitat may cause a large reaction from nature.





➤ Habitat destruction is due to:

• **Natural changes as:**

- Hurricanes.
- Fires.
- Floods.
- Volcanic eruptions.
- Destructive earthquakes.
- Diseases of living organisms.
- Lack of food for many living organisms.



Earthquake



Flood



Drought



Landslide



Tsunami



Forest Fire

➤ Benefits of habitat destruction:

- ★ Volcanic eruptions: make the soil fertile.
- ★ Forest fires: release seeds from closed fruits (sealed pods).
- ★ Diseases of living organisms: keep populations of animals to a suitable number that can be controlled in an ecosystem.

➤ Human activities that cause habitat destruction:

1. Building houses.
2. Building factories to produce goods.
3. Construction of infrastructure such as roads and railway tracks for the transportation of both people and materials.

➤ Human activities cause many harms to the habitats as:

1. Natural spaces, such as hills, prairies and valleys are turned into factories and homes that led to deforestation.
2. Lands have been destroyed for mining, making road and airport runways.

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3. Pollution and waste produced by humans have led to an increase in the percentage of carbon dioxide gas and other gases in the atmosphere, which lead to an increase in the Earth's temperature.

➤ Climate change:



- Human activities can cause habitat destruction which makes climate change.

• The climate change may lead to extinction of living organisms where:

1. Humans cause increasing the rate of the climate change on the Earth.
2. This rate leads to the changes of habitats which all living organisms depend on.
3. Living organisms (plants and animals) are affected by the changes in their habitats, so they change their behaviors to adapt to their new habitats.
4. Sometimes living organisms can't adapt or move in new conditions and this leads to their extinction.

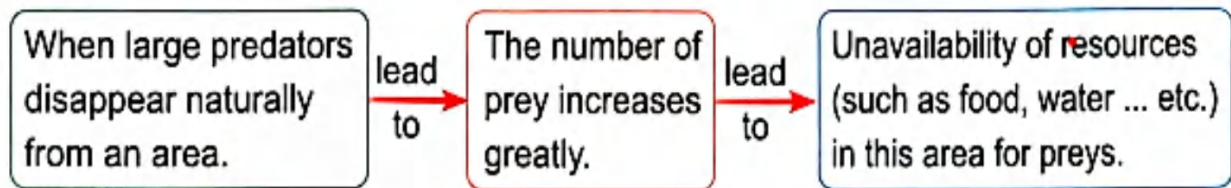
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Overpopulation

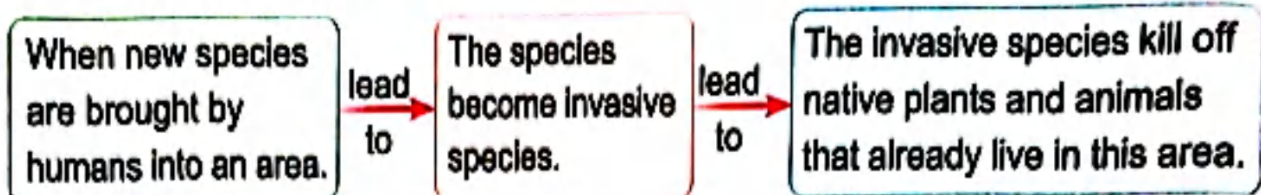
It is the increase in the number of a certain species of living organisms in a habitat.

- It leads to less food, water, shelter and space for other populations (organisms) that live in the same habitat.

1 Overpopulation may happen due to natural changes :



2 Overpopulation may happen due to human activities :



Example of an invasive species:

In some areas of the Red Sea, lionfish are the reason for the loss of 79% of young fish of the native species population.



Sometimes humans are doing the same damage as invasive species, because the overpopulation of humans causes shortage of some resources (such as food, water, ... etc.) for both humans and other organisms on Earth.

Concept (4.2) Lesson (4)

Reducing water pollution

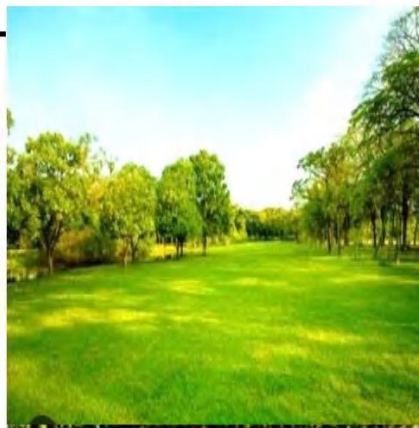


- The human population is constantly increasing that lead to increasing the number of industries which use water, and also increasing the rate of water pollution.

Methods of reducing water pollution



1. Treatment of sewage and industrial water.



2. Keeping green areas.



3. Using suitable amounts of fertilizers.



4. Getting rid of trash in correct ways.



5. Using soil fences and sedimentation ponds.



6. Controlling air pollution that produced from cars and industry can reduce water pollution.

✱ Preventing water pollution is more effective than cleaning up pollution from water that requires a lot of time and effort.

✱ Healthy soil is important to maintain healthy ecosystem, as the soil keep the life on the Earth.

✱ All living organisms depend on the soil to get their needs.

✱ Human like all living organisms need shelter to survive, but the processes of making building materials can cause pollution which damage the environment.

➤ Harms of traditional bricks



• Soil scientists and engineers hope to stop depending on traditional bricks and concrete, because they cause harms for the environment, where:

• The bricks must be burned at more than 1000°C.

• The ingredients of cement must be burned at 1450°C.

• The manufacture of bricks and cement require a lot of energy and produce a lot of pollution.



Using soil to build sustainable homes:



- Scientists transform soil into building materials where they add chemicals to the soil that turn the clay of soil into glue like substance which bind the materials together.
- The glue-like substance is made by chemical change of the soil.
- In this process, the scientists don't use the topsoil which is used for agriculture, but they use the subsoil which is found beneath the topsoil that is available around the Earth.
- The new substance is used to build sustainable homes instead of the traditional bricks.



Under Supervision: Mrs. Dalia Fawzy

موقع الدكتور محمد رزق التعليمي

امسح الباركود بالموبايل لتثبيت
التطبيق وتحميل كل الملازم مجاناً وبسرعة



حمل التطبيق الآن



كورسات ونتائج امتحانات



ملازم ثانوي



ملازم اعدادي



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